Fixing prices for private and public tenders submitted by construction firms

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Fixing prices for private and public tenders submitted by construction firms; an empirical investigation

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SOM-theme E: Financial markets and instituations

Abstract

This article gives an account of an investigation into the way in which construction firms fix tender prices in actual practice. It shows, among other things, that long-term consequences of contracts have a major effect on tender price levels.

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1. Introduction

The construction industry is an important part of Dutch industry. This branch of industry is made up of over 30,000 companies that generate an annual turnover of NLG 45 billion and provide jobs for 350,000 employees (6,2% of the labour force). Approximately 75% of all prices of projects in the construction industry are fixed through private and public tendering (1). In the case of private tendering, a customer engaged on a building project specifies his requirements in construction specifications and then asks a few selected construction firms to submit a tender. In the case of public tendering, the customer gives all construction firms an opportunity to submit a tender. The construction firm that submits the lowest tender will then get the contract. It is of course of crucial importance to the construction firms to fix their tender prices at the right level. If their prices are too low, the contract will result in a loss, and if their prices are too high, they will not get the contract.

Since relatively little is known about the way in which construction firms fix tender prices, an exploratory empirical investigation has been carried out. It is described in this article, which has been divided into sections as follows. Section 2 describes how the investigation was carried out. A few theoretical models of the fixing of tender prices will be discussed in section 3. Section 4 describes the practice of fixing prices for private tenders and section 5 shows how this is done for public tenders. Section 6 contains a brief discussion of so-called preliminary meetings. A number of conclusions are presented in section 7.

2. Research method

The investigation was carried out in 1999 at 9 Dutch main contractors. First, a detailed pilot study was conducted at one construction firm to get a first impression of the way in which construction firms fix tender prices, and of any relevant factors. At this construction firm a total of 10 interviews (of 1 to 2 hours) were held with the management, a salesman, a costing clerk, and the head of the works office. Next, 8 construction firms with at least 40 employees and located in the northern part of the Netherlands were selected from a business directory (4 firms involved in house-building and the building of public utilities, and 4 firms involved in civil engineering) and they were asked to participate in the investigation. All firms were willing to do so and subsequently with the manager of each firm an interview (averaging 2 hours in length) was held to check whether the impressions obtained during the pilot study were correct, and to gather additional information. The data on the firms concerned are listed in Appendix 1.

3. Theoretical models of the fixing of tender prices

Introduction. The submission of construction firms' tenders can be seen as an auction with several bidders, where the one who makes the lowest bid gets the contract (2). The bidders' main problem is obviously the fixing of the level of the bid price (tender price). To solve this problem, a large number of mathematical models have been developed. These theoretical models can be divided into decision theoretic models and game theoretic models.

Decision theoretic models. Decision theoretic models are based on the assumption that every individual bidder optimizes his behaviour. Most decision models are based on Friedman's work (1956). These models are based on the assumption that a higher bid price will mean not only that more profit can be made on the contract, but also that there is less chance of getting the contract. The optimum bid price is therefore the price resulting in the highest expected profit (profit made on the contract x chance of getting the contract). The chances of getting the contract for the various levels of the bid price can be estimated by using information about the successfulness of the firm's previous bid prices or historical information about its competitors' bid prices. See Milgrom (1989) for an overview of the various decision theoretic models.

Game theoretic models. Game theoretic models view auctions as games with incomplete information. They assume that there is an underlying true state of nature which prescribes the characteristics of the objects being auctioned and the utility functions of the players. Further they assume that all players know what true states of nature are possible and the probability distribution of these possible states, but that the players do not know what true state of nature prevails in a particular situation. However, each player may receive some information about the true state of nature by observing the value of a random variable. Based on this information each player must determine his bid. In determining his bid, each player must consider how the other players would bid for all possible values of information they might observe and the aim of game theoretic models is to determine which bid strategy results in a so-called Nask equilibrium. Game models are quite elegant, mathematically speaking, but in an extensive review Rothkopf and Harstad (1994) conclude that game theoretic models do not provide an accurate description of bidders' actual behaviour and that there is no evidence that game theoretic models are used in practice to decide how much to bid in particular auctions so the results of this study will be compared with Friedman's model only. See Rothkopf (1994) for an overview of the various game theoretic bidding models.

Decision on making a bid. Bidders can also be faced with the problem that making a bid involves costs (e.g. survey costs or costs incurred when estimating the cost of executing a project). Before fixing a bid price, the bidders have to decide first whether or not to make a bid. They have to compare the costs involved in making the bid with the profit they expect to make after making the bid. However, it is very difficult to estimate the expected profit when the preliminary costs have not yet been incurred. No adequate (theoretical) solutions to this problem have been suggested.

4. Fixing prices for private tenders in practice

Introduction. In the case of private tendering, the customer asks a limited number of construction firms (usually 3-6) to submit a tender and then awards the contract to the firm that has submitted the lowest tender price (3). The advantage of private tendering, as opposed to public tendering (which will be discussed in section 4), is that the customer can select construction firms on the basis of quality, so that it is very likely that the contract will be executed well. As far as the construction firms are concerned, the advantage of the limited number of competitors is the relatively great chance of submitting a successful tender, so they do not have to incur relatively high costs for tenders that have very little chance of being successful. In the Netherlands about half of all construction contracts are the result of private tendering (Jansen and Nijman, 1997). The percentage of contracts won through private tendering ranged from 10 to 60% in the case of the investigated construction firms (see Appendix 1) (4).

Acquisition. In the case of private tendering, the customer selects a limited number of construction firms, asks them to submit a tender and then awards the contract to the firm that has submitted the lowest tender price. In other words, construction firms need to be selected by potential customers in order to be able to submit tenders and get contracts. The firms try to persuade potential customers to select them.

The ways in which the investigated construction firms try to win new contracts are listed in Appendix 2. In the firms concerned it is mainly the management and project managers who try to get new contracts, although some (bigger) construction firms also use special salesmen. They all try to convince potential customers that their construction firm has the know-how and experience to execute diverse construction projects, provides excellent quality and is not expensive, so that their firm ought to be asked to submit tenders for the customers' next construction projects. They visit customers that regularly have construction projects carried out in their region (e.g. housing associations, estate agents, and municipalities) and also visit customers that have concrete building plans (5). Architects and engineering firms are regularly visited as well, because they often advise customers on suitable construction firms for particular projects. Most importantly, the construction firms try to maintain contacts with customers, architects and engineering firms that were developed during previous projects. They visit these business contacts regularly, not only to keep in contact, but also to keep themselves informed of new building plans. The construction firms also maintain contacts by sending little tokens of attention for the festive season and by inviting business relations to such events as important football matches, concerts and the like.

Decision on tendering. It appears that, in practice, the question of whether or not to submit a private tender is for the most part a theoretical problem. All of the investigated construction firms indicated that, when they are asked to submit a tender, they (almost) always comply with this request. Even if they do not really want the contract (for instance because they have already taken on a lot of orders) (6). Their reasoning is that, after all, they try to persuade customers to ask them for a tender and that they would make a very odd impression if, on succeeding in being asked, they then refused to submit a tender. As a result, the customer concerned probably would

not ask the construction firm to tender for its next project, although the construction firm might really need the contract by then. Existing contacts, in particular, regard a refusal to submit a tender as an 'insult' that worsens relations.

Budgeting project costs. All investigated firms indicated that they base a tender price on an estimate ('budget') for the cost of a building project (7). The cost of subcontracted work is estimated on the basis of tenders submitted by subcontractors, and the construction firm's own costs are estimated on the basis of standards set during earlier projects. An overhead charge is then added to the estimated (direct) project costs. Because a wrong cost estimate can lead to big losses, the estimate is usually also checked for mistakes by another costing clerk (or by the head of the costing department).

Factors affecting tender prices. The persons responsible for fixing tender prices and the factors affecting tender price levels are listed in Appendix 3.

Tender prices are fixed by the management. The costing clerk (or the head of the costing department) is usually present to explain the cost estimate and the risks attached to the execution of the project (8).

Construction firms try to fix tender prices that not only cover direct project costs, but also include an overhead charge and a mark-up for profit (tender price = direct project costs + overhead charge + mark-up for profit). However, they often do not apply this formula in actual practice, because they take account of the following factors:

(1) orders on hand.
Construction firms with few orders on hand run the risk of creating idle capacity. In these circumstances it is even more important to get new contracts and therefore the firms are prepared to accept a lower tender price.

(2) expected follow-up contracts.
A construction firm develops a relationship with its customer by executing a contract. If the contract has been performed to the customer's satisfaction, the construction firm will usually be asked by the customer to submit a tender for the customer's next projects. If the customer regularly has projects carried out, it is it even more attractive to secure a contract, so the construction firm will be prepared to accept a lower tender price.

(3) type of contract.
Sometimes special constructions or special materials are used in a project, and construction firms want to gain experience in order to secure future contracts for similar projects. They are therefore prepared to submit a lower tender price to secure the contract. Some construction firms are particularly experienced in a certain area and do not want competitors to become equally experienced, so they, too, are usually prepared to accept a lower tender price.

(4) special project risks.
There are sometimes special risks attached to the execution of a project. The exact costs involved cannot be estimated easily. For example, when a sewerage system is modernized, usually no exact information about the state of the various parts of the sewerage system is available. In a case like this, the construction firm adds a mark-up for risk to the tender price to prevent a big loss on the project. A special risk can also be the result of a customer's

attitude. Customers check whether a project is being executed in accordance with the tender-specifications. Some customers are known to be very fussy and to demand that the specifications should be followed precisely. Because this may result in higher execution costs, construction firms add a mark-up for risk to the tender price for this type of customer.

(5) estimates of competitors' prices.
On more than half of the occasions when private tenders are invited, the construction firms know which other construction firms have been asked to submit a tender (Lourens, 1995). This information can get out because the customer arranges a meeting to give all construction firms involved an opportunity to obtain further information about specifications or because these construction firms ask the same subcontractors (or suppliers) for a quotation. As a result, these subcontractors and suppliers know which construction firms are preparing a tender for a particular project. Obviously, construction firms are not prepared to tell their competitors which tender price they are going to submit, but about half of the investigated construction firms indicated that, if they know who their competitors are, they will make an estimate of their competitors' tender prices (on the basis of their own project budget and the competitors' orders on hand) and that they take their competitors' prices into account when fixing a tender price. The remaining construction firms indicated that they do not attempt to estimate their competitors' tender prices, because they consider this too speculative.

(6) already covered overhead.
As we have seen, the project budget of a construction firm includes an overhead charge. If a lot of contracts are executed in a particular year, overhead may have been completely covered before the end of the year. In that case about half of the investigated firms no longer include an overhead charge in the tender price.

(7) minimum tender price.
The investigated construction firms indicated that they are not prepared to fix a tender price that is lower than a particular minimum price. Most of the firms indicated that the minimum tender price equals direct project costs (excluding overhead charge). Some firms indicated that, in very special cases, they would be prepared to accept a limited loss on direct project costs in order to get a contract. Interestingly, these are the firms that indicated that they take account of the (estimated) prices of their competitors when fixing a tender price (9).

Way of fixing tender prices. The way in which the investigated construction firms fix tender prices in practice is shown schematically in Figure 1. The tender price is based on the project budget (direct project costs plus overhead charge) and is, in principle, fixed at the level of the project budget plus a reasonable mark-up for profit (10). If there are special risks attached to a project, then the tender price includes a mark-up for risk. Next, the construction firm decides how much it wants the contract on the basis of its orders on hand, expected follow-up contracts, and the type of contract. If the construction firm really wants to get the contract, it will be prepared not to add the

mark-up for profit, and if the firm really needs the contract (e.g. because of idle capacity), it will be prepared not to add the overhead charge either. In that case the tender price will be fixed at the level of the direct project costs. Some firms do not add the overhead charge when the general expenses have already been completely covered. About half of the investigated firms also take account of the estimated tender prices of their competitors. If they really want to get a contract and the (estimated) tender prices of the competitors are below the level of the direct project costs, then these firms will be prepared to accept a limited loss on the direct project costs.

Submitting several tender prices. The way in which a construction project has to be executed is set out in the specifications drawn up by the customer. Some of the investigated construction firms indicated that they occasionally submit two tender prices when they think that the project can be executed at a lower cost (without loss of quality) by deviating from the specifications. One of the tender prices is based on the specifications and the other (lower) tender price is based on justifiable alterations in the specifications. It is left to the customer to decide whether he finds the suggested changes to the specifications acceptable; so the customer decides which of the two tender prices is the relevant one.

Fixing a tender price when a construction firm does not really want the contract. Sometimes a construction firm that is asked to submit a tender does not really want to get the contract, because it has already many orders on hand. As we have seen, the construction firm cannot afford not to submit a tender, because it would not be considered for future contracts if it refused. The firm can prevent the contract being awarded to it by submitting a high tender price, but this is not a real option. Customers might begin to think that the firm is too 'expensive' and they might decide not to invite the firm to submit tenders for future projects. If the construction firm knows which firms are also competing for the contract, it can solve the price problem by explaining the situation to a competitor with which it maintains good relations. The construction firm then asks the competitor which tender price it is going to submit for the project, and the construction firm submits a tender price that is slightly higher than the competitor's tender price. This way the construction firm is certain that it will not get the contract and also does not create the impression of being expensive. Another advantage of this method is the fact that an estimate of the project costs does not involve a lot of work (11).

If the construction firm does not know which firms are competing for the contract, it has little choice but to submit a tender that is based on an estimate of the project costs. In that case the tender price is fixed at the level of the direct project costs, to which an overhead charge and a mark-up for profit are added (plus a mark-up for special project risks, if necessary). The tender price will not be very low, so there will be relatively little chance of getting the contract. If the construction firm gets the contract after all, it will make a reasonable profit on the contract, but it will also have to execute the contract. In that case other contracts will be postponed (so that the firm's capacity increases) and a larger part of the firm's activities will be contracted out to subcontractors.

5. Fixing prices for public tenders

Introduction. In the case of private tendering, a limited number of construction firms are invited by a customer to submit a tender. In an open procedure, however, every construction firm that wants the contract can submit a tender (12). The customer benefits from public tendering because of maximum competition between the construction firms, which often results in lower prices in public tenders than in private tenders. Another advantage is the open and fair procedure, which prevents favouritism on the part of the customer (an argument about which government institutions often feel strongly). A disadvantage of public tendering is the fact that the customer cannot select construction firms beforehand (on the basis of quality) and is therefore less certain that the project will be executed well. Moreover, some construction firms tend to provide low quality as a result of low prices in public tenders. The customer often incurs additional costs because quite detailed specifications have to be drawn up and the quality of work has to be checked in detail. About a quarter of all construction projects in the Netherlands are put out to contract by public tender. This method is often used by government bodies and in big projects (Jansen and Nijman, 1997). The percentage of contracts won through public tendering ranged from 0 to 60% in the case of the investigated construction firms (see Appendix 1).

Acquisition. In the case of public tendering, all construction firms can submit a tender, so they do not have to engage in activities aimed at persuading customers to invite them to submit a tender.

Decision on tendering. As we have seen, construction firms that are asked to submit a private tender (almost) always comply with this request. A refusal would mean that the customer concerned probably would not ask the construction firm to tender for its next building project. This argument is irrelevant to public tendering, so construction firms are free not to submit a tender. Two of the investigated construction firms (construction firms B and I) indicated that they never participate in an open procedure, firstly because they have little chance of getting the contract owing to the large number of tenderers (whereas submitting a tender involves considerable costs), and secondly because of the usually low profitability of contracts won through public tendering. Four construction firms (A, C, D, and G) indicated that they only occasionally submit public tenders. These firms, too, indicated that contracts won through public tendering usually yield little profit, but that they sometimes submit a tender anyway in order to develop relations with a customer, to show a customer that they are 'a player in this market too' (i.e. are not expensive) or to prevent idle capacity. In fact, these construction firms submit public tenders to prevent idle capacity or to get more profitable contracts in the future. Three firms (E, F, and H) indicated that they regularly submit public tenders for building projects. These firms have been engaged in civil engineering projects and in building cable networks; a relatively large number of projects of this kind are put out to contract by public tender. These firms, too, only submit a public tender if they really want the contract, and they do not submit a tender if they have already taken on enough work.

Fixing prices for public tenders. The way in which construction firms fix prices for public tenders is in principle not different from the method they use for private

tenders, and tender price levels are affected by the same factors. However, the firms indicated that they have to submit competitive prices in public tenders in order to get contracts and that they therefore accept a lower mark-up for profit in public tenders. They usually do not know their competitors in an open procedure, so they do not often base a tender price on the estimated tender prices of their competitors.

6. Preliminary meetings

Before 1992, a construction firm that was going to submit a tender for a particular project had to inform the industrial association, which thereupon passed this firm's name on to other firms that also had indicated that they would submit a tender for this project. As a result, all firms always knew who were competing for a particular project. Especially when private tenders were invited, competitors often met before submitting their tenders, in order to decide among themselves who should get the contract and then adjust their tender prices accordingly.

In 1992 this practice was prohibited by the European Commission, but it is possible that construction firms still hold preliminary meetings. Although the investigated construction firms obviously were not prepared to say anything about their possible participation in prohibited practices, most of them were willing to talk in general terms about practices in their branch of industry. It seems that construction firms still hold preliminary meetings, but less often than before 1992. Construction firms now do not always know who are competing for a particular contract (especially when public tenders are invited), so they cannot invite all competitors to a preliminary meeting. Furthermore, many construction firms, the larger ones in particular, are no longer willing to attend preliminary meetings after the introduction of severe penalties in 1992. Obviously, preliminary meetings are only effective if all competitors attend (otherwise an absent construction firm could well get the contract).

7. Comparison with Friedman's model

When we compare the results of this study with Friedman's model of bidders' behaviour, the following differences attract attention:

(1) the effect of long-term consequences of a contract.
Friedman's model only takes account of the short-term consequences of a contract (revenue and expense). In practice, the long-term advantages of a contract (follow-up contracts, opportunities to gain specific experience, etc) appear to play an important part in the fixing of a tender price. The more long-term advantages, the more willingness on the part of construction firms to lower a tender price in order to secure a contract, i.e. the more willingness to give up short-term advantages (project profit).

(2) the effect of orders on hand.
In practice, current contracts of construction firms appear to have a major effect on tender price levels. The fewer orders on hand, the more willingness

on the part of construction firms to submit a lower tender price in order to secure a contract (13).

(3) the decision on tendering.

In practice, the question of whether or not to submit a private tender is not really a problem. Because construction firms try to persuade customers to invite them to submit a tender, a refusal would mean that the construction firms would not be asked to tender for the customers' next projects (although the construction firms might really need a contract by then). Again, long-term consequences appear to have a major effect on the construction firms' decisions.

(4) the maximization of expected profit.

According to Friedman's model, a tender price for a contract is fixed at such a level that the expected profit on the contract (profit made on the contract x chance of getting the contract) is the highest possible. This assumption is only partly confirmed by the investigation, which shows that construction firms tend to determine their need for a contract on the basis of expected long-term advantages and their current contracts. In fact, they implicitly determine their required chance of getting the contract, and then set the level of the tender price accordingly (the lower the tender price, the greater the chance of getting the contract). In other words, the tender price is not fixed at such a level that the expected profit is the highest, but at such a level that the chance of getting the contract equals a predetermined probability. This probability is determined on the basis of the long-term advantages of the contract and the construction firm's current contracts (14).

(5) the exchange of information between bidders.

In Friedman's model no information is exchanged between bidders. In practice, information is regularly exchanged, however. For example, construction firms that would rather not get a contract (after submitting a private tender) often obtain information about their competitors' tender prices. Information about tender prices is also exchanged during preliminary meetings.

(6) (economically) nonrational behaviour.

Construction firms sometimes display behaviour that is difficult to explain, economically speaking. For example, when fixing tender prices, about half of the investigated firms do not include an overhead charge in their tender price when all overhead costs already are covered by earlier contracts. According to economic theory, however, this is rational behaviour only in case of incidental contracts and not in case of "normal" contracts (Van de Schroeff, 1970).

Notes

(1) In the remaining cases, a price is fixed after negotiations with only one construction firm (single tender) or a price equalling the costs incurred is charged after completion of the project (cost plus contract). These ways of fixing prices will not be discussed in this article.

(2) This type of auction is called a 'first price sealed low bid auction' in the literature on the subject.

(3) Since 1992, customers are, strictly speaking, no longer obliged to award the contract to the firm that has submitted the lowest tender price. However, the contract is still awarded to this firm in nearly all cases.

(4) The percentage of contracts won through private tendering depends on the market in which the construction frim is active (building or civil engineering) and on the marketing strategy of the firm.

(5) Information about these buildings plans is obtained from specialist journals, newspapers, zoning plans, and from the minutes of council meetings (e.g. building permits). Construction firms also use firms specializing in the collection of information about building plans. One construction firm also receives information from informants (who are paid for it).

(6) Construction firms sometimes refuse to submit a tender if they have had very bad experiences with a certain customer in the past (for example as far as payment is concerned).

(7) If the contract is secured, the cost estimate will also be used to control execution costs.

(8) Sometimes the project manager is present as well. In two construction firms (E and F) the management make the cost estimates themselves, so no costing clerk is present when the tender prices are fixed.

(9) One firm (construction firm G) uses a minimum price that is made up of direct project costs plus an overhead charge. A lower tender price is possible in special circumstances, subject to the group management board's consent.

(10) A reasonable mark-up for profit is determined by demand, so the mark-up for profit is higher when demand is up than when demand is down. Construction firms generally know what the usual mark-up for profit is in the open market.

(11) Of course this procedure is based on the assumption that the construction firm will not use the information to submit a competitive tender after all. Obviously, a firm could do this only once in the construction industry (where everybody knows everybody).

(12) However, the customer can demand that construction firms meet general requirements, for example requirements concerning firm size or experience with similar projects.

(13) Apparently construction firms not only take account of the accounting costs of projects, but also of the opportunity costs.

(14) Broadly speaking, it is possible to say that construction firms are maximizing their long term profits.

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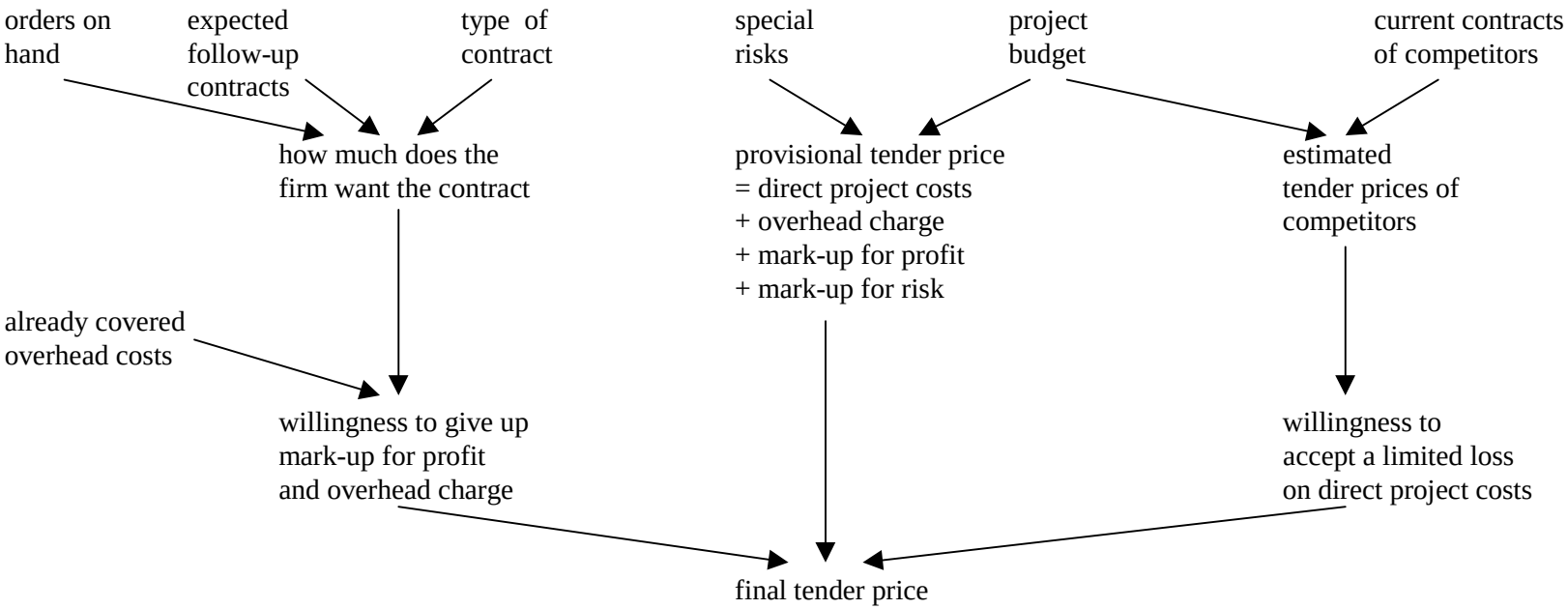

Figure 1 Fixing tender prices

Appendix 1

	A	B	C	D	E	F	G	H	I
Number of employees	250	45	130	240	40	90	120	110	80
Type of construction firm	House-building and the building of public utilities	House-building and the building of public utilities	Earth moving and road-building	House-building and the building of public utilities	Earth moving and road-building	Earth moving and road-building	House-building and the building of public utilities	Earth moving, road-building, and installation work	House-building and the building of public utilities
Type of contracts	Building of new houses Maintenance Renovation Alteration	Maintenance Alteration Asbestos removal (Small-scale) building of new houses	Road-building Sewerage Soil sanitation Demolition work	Building of new houses Maintenance Renovation Alteration	Road-building Sewerage Earthwork	Road-building Sewerage Earthwork Soil sanitation	Building of new houses Major maintenance Renovation	Road-building Sewerage Earthwork Electric installations Cable networks	Building of new houses Maintenance Renovation
Customers	Firms Housing associations Estate agents Government Private persons	Firms Private persons Housing associations Pension funds Government	Government Firms	Firms Housing associations Government Estate agents	Government	Government Firms	Housing associations Government Estate agents Firms	Government Utilities (Big) firms	Housing associations Government Firms
Region where the firm operates	Groningen Drenthe	Groningen N-Drenthe	Groningen Friesland Drenthe	Mainly 3 northern provinces	Groningen Friesland Drenthe	Groningen Drenthe	Groningen Friesland Drenthe NO-Polder	Mainly 3 northern provinces	Groningen Drenthe
Type of tender (%)									
(1) Private	50	20	Approx. 50	50	60	35	45	35	10
(2) Public	2	--	1	2	20	20	1	60	--
(3) Single	40	80	Approx. 50	45	30	45	45	5	90
(4) Other	8	--	--	3	--	--	9	--	--

Appendix 2

	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
In charge of acquisition	Management 1 Salesman Project managers Foremen	Management Project managers	Management Project managers	Management Project managers	Management	Management Project managers	Management Project managers	Management Project managers	Management Project managers 2 Salesmen
Persons visited	Customers Architects Existing contacts	Customers Architects Existing contacts	Customers Engineering firms Existing contacts	Customers Architects Existing contacts	Customers Existing contacts	Customers Engineering firms Existing contacts	Customers Architects Consultancy firms Existing contacts	Customers Engineering firms Existing contacts	Customers Architects Existing contacts
Supporting activities	Token of attention for the festive season Sponsoring Project development Advertising	Token of attention for the festive season Events	Token of attention for the festive season Advertising	Events Advertising Project development	Token of attention for the festive season Events	Events Advertising	Token of attention for the festive season Events Informants	Token of attention for the festive season	Token of attention for the festive season Events

Appendix 3

	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Responsible for fixing tender prices	Management Head of costing department	Management Head of costing department	Management Costing clerk Project manager	Management Costing clerk	Management	Management	Management Head of costing department	Management Costing clerk	Management Costing clerk Project manager, if necessary
Factors affecting tender prices	Cost estimate Current contracts Expected follow-up contracts Special risks Estimated prices of competitors	Cost estimate Current contracts Expected follow-up contracts Special risks Estimated prices of competitors Type of contract	Cost estimate Current contracts Expected follow-up contracts Special risks Type of contract Covered overhead	Cost estimate Current contracts Expected follow-up contracts Special risks Estimated prices of competitors Type of contract	Cost estimate Current contracts Expected follow-up contracts Special risks Estimated prices of competitors Period of execution Covered overhead	Cost estimate Current contracts Expected follow-up contracts Special risks Period of execution Covered overhead	Cost estimate Current contracts Expected follow-up contracts Special risks Estimated prices of competitors Period of execution Covered overhead	Cost estimate Current contracts Expected follow-up contracts Special risks	Cost estimate Current contracts Expected follow-up contracts Special risks Estimated prices of competitors
Minimum tender price	Direct costs minus limited loss	Direct costs minus limited loss	Direct costs	Direct costs minus limited loss	Direct costs minus limited loss	Direct costs	Direct costs plus overhead charge	Direct costs	Direct costs minus limited loss